

**Journal Abstract**

**Title:** *Ageing as a Gravitational Phenomenon: Reframing Senescence Through the Lens of Microgravity*

**Abstract:** This paper proposes a theoretical model in which ageing is primarily driven not by time itself, but by sustained exposure to gravitational pressure. While ageing is traditionally seen as the result of DNA degradation, telomere (pronounced *Tell-oh-meer*) shortening, and oxidative stress, these processes may be significantly accelerated by Earth's gravity, which imposes constant mechanical strain on cells and tissues. Observations of astronauts in space have revealed anomalies, including telomere lengthening and altered cellular behavior in microgravity environments. These findings support the hypothesis that the absence of gravity reduces cellular fatigue, potentially delaying senescence. Furthermore, the mating of senescent cells in gravity-bound systems may compound degradation effects, whereas in gravity-free conditions, cellular reproduction might proceed with less inherited fatigue. This framework challenges the time-centric model of ageing, suggesting that longevity may be a byproduct of the right pressure environment—making space not only a frontier for exploration, but for biological evolution.

---

**Research Poster Format**

**Title:** *Gravitational Ageing: A Theoretical Break from Time-Based Senescence*

**Hypothesis:** Ageing occurs not because of time—but due to **gravitational fatigue** acting on biological systems.

**Observations:** - **Astronaut Studies:** Telomere elongation in low-Earth orbit.

- **Cellular Mechanics:** Senescent signals increase with stress & compression.

- **Space Biology:** Cells behave differently in microgravity—less inflammation, altered gene expression.

**Mechanism: On Earth:**

- Gravity = Constant Pressure
- Pressure = Mitochondrial strain
- Strain = Ageing

**In Space:**

- Microgravity = Pressure relief
- Relief = Improved cellular integrity
- Potential = Delay or pause in ageing

**Theoretical Proposal:** Senescence may be an **adaptive response** to Earth's gravitational field. Remove the stressor → adjust the ageing curve.

**Implications:** - Reversing or slowing ageing via **low-gravity therapy**  
- Birth of a new field: **Gravitational Biogerontology**  
- Longevity research must include **gravitational context**

---

### Short Video Script

[Opening shot: Earth slowly rotating. Calm music.]

**Narrator:**

"What if ageing... isn't about time at all?"

[Cut to: astronauts floating in space, slow motion.]

"While we've always believed that getting older is inevitable, a few anomalies suggest... otherwise."

[On screen: 'Telomere elongation. Reduced inflammation. Rewritten genes.']

"In space, where gravity nearly vanishes, something strange happens. Cells behave *differently*. Almost... younger."

[Cut to: side-by-side comparison of Earth cells vs Space cells.]

"This leads us to a bold theory:  
Ageing might be a *pressure response*, not just a countdown."

[Zoom into cells bending under weight, then relaxing in zero-G.]

"What if gravity wears cells out—bit by bit—causing fatigue, senescence, and eventually death?"

[Text on screen: "Remove the pressure, restore the potential."]

"Could the cure for ageing... be written in the stars?"

[Fade out with a single phrase:] "*Ageing is not time—it's tension.*"